

1. Let $f(x) = x^5 - 3x^3 + 1$.

Use the bisection method to find an interval of length $\frac{1}{32}$ that contains the root of $f(x)$ that lies between $x = 1$ and $x = 2$.

2. Let $f(x) = x^2 - 2x$. Determine the following limits

(a) $\lim_{x \rightarrow 3} f(x)$

(b) $\lim_{x \rightarrow 3} \frac{f(x) - f(3)}{x - 3}$

(c) $\lim_{x \rightarrow a} \frac{f(x) - f(a)}{x - a}$ where a is any fixed real number